CLAIMS:

1. A short interfering RNA (siRNA) duplex that includes complementary sense and anti-sense sequences corresponding to at least part of the A3 adenosine receptor (A3AR) mRNA sequence, or an alternative splice form, mutant or cognate thereof.

2. A double-stranded RNA (dsRNA) construct that can be converted within a cell into a siRNA duplex of Claim 1.

3. A transcript system that can induce transcription within cells of either a siRNA duplex according to Claim 1 or a dsRNA construct according to Claim 2.

4. The siRNA duplex of claim 1 wherein the sense sequence is identical to at least part of the A3AR mRNA sequence and the antisense sequence is complementary to at least part of the A3AR mRNA sequence.

5. The siRNA duplex of Claim 1 wherein the sense or antisense sequences sufficiently correspond to at least part of the A3AR mRNA sequence so as to activate RNA interference-based cleavage of the mRNA sequence.

6. The siRNA duplex of Claim 1 which includes at least one of the following features:

(a) the sense and antisense sequences in the siRNA duplex that can pair with one another include approximately 20 to 22 nucleotides within the coding region of the A3AR mRNA;

(b) at least one of said sense or antisense sequences in the siRNA duplex have a short tail of poly T;

(c) at least one of the sense or antisense sequences in the siRNA duplex have no G-nucleotide at the 3' end;

(d) the GC contents is less than 50%; and

(e) the sequences are unique to the A3 adenosine receptor and have no similarity to the other subtypes of adenosine receptors.

7. A method for treating a hyperproliferative disease comprising contacting hyperproliferating cells with an active agent, selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3.

8. A pharmaceutical composition for the treatment of hyperproliferative disease comprising as active agent an effective amount selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3.

9. A method for inhibiting expression of the A3AR gene in target cells comprising introducing an active agent into said target cells, wherein said active agent is selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3.

10. The method of claim 9 in which the A3AR gene expression is inhibited by at least 25%.

11. The method of claim 9 wherein the active agent is transfected into the target cells by a delivery system.

12. A method of activating A3AR-specific RNA interference in a target cell comprising introducing into said target cells an active agent, wherein said active agent is selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3.

13. A recombinant plasmid comprising nucleic acid sequences for expressing one or more of the sequences comprising the siRNA duplex of claim 1.

14. A kit comprising reagents for activating A3AR-specific RNA interference in a cell or organism.

15. Use of an active agent, selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3 in the preparation of a pharmaceutical composition for use in a method for treating a hyperproliferative disease.

16. Use of an active agent selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3 in the preparation of a pharmaceutical composition for use in a method for inhibiting expression of the A3AR gene in target cells.

17. Use of an active agent, selected from the siRNA duplex of Claim 1, the dsRNA construct of Claim 2 or the transcript system of Claim 3 in the preparation of a pharmaceutical composition for use in method of activating A3AR-specific RNA interference in a target cell.

18. The siRNA duplex of claim 1 comprising the following respective sense and antisense sequences: r(GUGACCCACCUGUGAUGAG)d(TT) [SEQ ID No:5] and r(CUCAUCACAGGUGGGUCAC)d(TT) [SEQ ID No:6].

19. The siRNA duplex of claim 1 comprising the following respective sense and antisense sequences: r(GGGUGCCUAGUUGACUUAC)d(TT) [SEQ ID No:8] and r(GUAAGUCAACUAGGCACCC)d(TT) [SEQ ID No:9].